

# microvg

*User Manual*



# MICROEJ<sup>®</sup>

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# Chapter 1. Data Structure Documentation

## 1.1. MICROVG\_GRADIENT\_HEADER\_t struct Reference

### 1.1.1. Data Fields

- jint count
- jfloat x
- jfloat y
- jfloat angle
- jfloat length
- jint colors\_offset
- jint positions\_offset

### 1.1.2. Field Documentation

## 1.2. MICROVG\_PATH\_HEADER struct Reference

### 1.2.1. Data Fields

- uint16\_t data\_size
- uint16\_t data\_offset
- uint8\_t format
- uint8\_t padding1
- uint8\_t padding2
- uint8\_t padding3
- float bounds\_xmin
- float bounds\_xmax
- float bounds\_ymin
- float bounds\_ymax

## 1.2.2. Field Documentation

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# Chapter 2. File Documentation

## 2.1. ui\_drawing\_bvi.h File Reference

```
#include "microvg_configuration.h"
```

### Detailed Description

Definition in file C:/Jenkins/workspace/master074c8e04/com.microej.clibrary.llimpl.microvg/target~/ccomponentWorking/bsp/ui/inc/ui\_drawing\_bvi.h

## 2.2. microvg\_configuration.h File Reference

### 2.2.1. Macros

- #define MICROVG\_CONFIGURATION\_VERSION (2)

*Compatibility sanity check value. This define value is checked in the implementation to validate that the version of this configuration is compatible with the implementation.*

- #define VG\_FEATURE\_GRADIENT\_FULL (1)
- #define VG\_FEATURE\_GRADIENT\_FIRST\_COLOR (2)
- #define VG\_FEATURE\_FONT\_FREETYPE\_VECTOR (1)
- #define VG\_FEATURE\_FONT\_FREETYPE\_BITMAP (2)
- #define VG\_FEATURE\_PATH
- #define VG\_FEATURE\_GRADIENT VG\_FEATURE\_GRADIENT\_FULL
- #define VG\_FEATURE\_FONT VG\_FEATURE\_FONT\_FREETYPE\_VECTOR
- #define VG\_FEATURE\_FREETYPE\_TTF
- #define VG\_FEATURE\_FREETYPE\_OTF
- #define VG\_FEATURE\_FREETYPE\_COLORED\_EMOJI
- #define VG\_FEATURE\_FONT\_COMPLEX\_LAYOUT
- #define VG\_FEATURE\_FONT\_EXTERNAL
- #define VG\_FEATURE\_FREETYPE\_HEAP\_SIZE ( 160 \* 1024 )
- #define VG\_FEATURE\_FONT\_COMPLEX\_LAYOUT\_HEAP\_SIZE ( 80 \* 1024 )

## Detailed Description

MicroEJ MicroVG library low level API: enable some features according to the hardware capacities.

Author: . MicroEJ Developer Team

Definition in file C:/Jenkins/workspace/master074c8e04/com.microej.clibrary.llimpl.microvg/target~/ccomponentWorking/bsp/vg/inc/microvg\_configuration.h

## 2.3. microvg\_font\_freetype.h File Reference

```
#include "microvg_configuration.h"
```

```
#include <stdint.h>
```

### 2.3.1. Functions

- void MICROVG\_FONT\_FREETYPE\_initialize ( void )

## Detailed Description

MicroEJ MicroVG library low level API: implementation over FreeType.

Author: . MicroEJ Developer Team

Version: . 3.0.1

Definition in file C:/Jenkins/workspace/master074c8e04/com.microej.clibrary.llimpl.microvg/target~/ccomponentWorking/bsp/vg/inc/microvg\_font\_freetype.h

## 2.4. microvg\_gradient.h File Reference

```
#include "microvg_configuration.h"
```

```
#include <sni.h>
```

### 2.4.1. Data Structures

- struct MICROVG\_GRADIENT\_HEADER\_t

### 2.4.2. Functions

- float MICROVG\_GRADIENT\_get\_gradient\_scale\_size ( void )



- uint32\_t MICROVG\_GRADIENT\_get\_gradient\_header\_size ( void )

## Detailed Description

MicroEJ MicroVG library low level API: implementation of LinearGradient.

Author: .    MicroEJ Developer Team

Version: .    3.0.1

Definition in file C:/Jenkins/workspace/master074c8e04/com.microej.clibrary.llimpl.microvg/target~\ccomponentWorking\bsp\vg\inc\microvg\_gradient.h

## 2.5. microvg\_helper.h File Reference

```
#include <stdio.h>
```

```
#include <sni.h>
```

```
#include "mej_log.h"
```

### 2.5.1. Macros

- #define MEJ\_LOG\_INFO\_MICROVG
- #define MEJ\_LOG\_ERROR\_MICROVG MEJ\_LOG(ERROR,MICROVG,fmt,##\_\_VA\_ARGS\_\_ )
- #define MICROVG\_HELPER\_NULL\_GRADIENT 0

*Set this define to monitor freetype heap evolution. It needs MEJ\_LOG\_MICROVG and MEJ\_LOG\_INFO\_LEVEL defines to print the heap logs.*

- #define FT\_FACE\_FLAG\_COMPLEX\_LAYOUT (((uint32\_t)1) << 31)

*Freetype supplementary flag for complex layout Uses a free bit in freetype face flags to convey the complex layout mode information with the freetype face. freetype.h must be checked on freetype update to ensure that this bit is still free.*

- #define M\_PI 3.1415926535
- #define RAD\_TO\_DEG ((r) \* (180.0f / M\_PI))
- #define DEG\_TO\_RAD (((d) \* M\_PI) / 180.0f)
- #define JFLOAT\_TO\_UINT32\_t (\*(uint32\_t\*)&(f))
- #define UINT32\_t\_TO\_JFLOAT (\*(float\*)&(i))

## 2.5.2. Functions

- void MICROVG\_HELPER\_initialize ( void )
- int MICROVG\_HELPER\_get\_utf ( unsigned short \* text, int length, int \* offset)

*Gets the UTF character from a text buffer at the given offset and updates the offset to point to the next character.*

- void MICROVG\_HELPER\_layout\_configure ( int faceHandle, unsigned short \* text, int length)
- bool MICROVG\_HELPER\_layout\_load\_glyph ( int \* glyph\_idx, int \* x\_advance, int \* y\_advance, int \* x\_offset, int \* y\_offset)
- jfloat \* MICROVG\_HELPER\_check\_matrix ( jfloat \* matrix)
- uint32\_t MICROVG\_HELPER\_apply\_alpha ( uint32\_t color, uint32\_t alpha)

## Detailed Description

MicroEJ MicroVG library low level API: helper to implement library natives methods.

Author: .    MicroEJ Developer Team

Version: .    3.0.1

Definition in file C:/Jenkins/workspace/master074c8e04/com.microej.library.llimpl.microvg/target~\ccomponentWorking\bsp\vg\inc\microvg\_helper.h

## 2.6. microvg\_path.h File Reference

```
#include "microvg_configuration.h"
```

```
#include <sni.h>
```

### 2.6.1. Data Structures

- struct MICROVG\_PATH\_HEADER

### 2.6.2. Typedefs

- typedef struct MICROVG\_PATH\_HEADER MICROVG\_PATH\_HEADER\_t

### 2.6.3. Functions

- uint8\_t MICROVG\_PATH\_get\_path\_encoder\_format ( void )

- uint32\_t MICROVG\_PATH\_convert\_path\_command ( jint command)
- void MICROVG\_PATH\_initialize ( void )
- uint32\_t MICROVG\_PATH\_get\_path\_header\_size ( void )
- uint32\_t MICROVG\_PATH\_get\_path\_command\_size ( jint command, uint32\_t nbParams)
- uint32\_t MICROVG\_PATH\_append\_path\_command0 ( jbyte \* path, uint32\_t offset, jint cmd)
- uint32\_t MICROVG\_PATH\_append\_path\_command1 ( jbyte \* path, uint32\_t offset, jint cmd, jfloat x, jfloat y)
- uint32\_t MICROVG\_PATH\_append\_path\_command2 ( jbyte \* path, uint32\_t offset, jint cmd, jfloat x1, jfloat y1, jfloat x2, jfloat y2)
- uint32\_t MICROVG\_PATH\_append\_path\_command3 ( jbyte \* path, uint32\_t offset, jint cmd, jfloat x1, jfloat y1, jfloat x2, jfloat y2, jfloat x3, jfloat y3)
- uint32\_t MICROVG\_PATH\_get\_command\_parameter\_number ( jint command)

## Detailed Description

MicroEJ MicroVG library low level API: implementation of Path.

Author: .    MicroEJ Developer Team

Version: .    3.0.1

Definition in file C:/Jenkins/workspace/master074c8e04/com.microej.library.llimpl.microvg/target~\ccomponentWorking\bsp\vg\inc\microvg\_path.h

## 2.7. microvg\_trace.h File Reference

```
#include "LLTRACE_impl.h"
```

### 2.7.1. Macros

- #define LOG\_MICROVG\_EVENTS 3
- #define LOG\_MICROVG\_IMAGE\_ID 0
- #define LOG\_MICROVG\_FONT\_ID 1
- #define LOG\_MICROVG\_DRAWING\_ID 2
- #define LOG\_MICROVG\_IMAGE\_load 0
- #define LOG\_MICROVG\_IMAGE\_create 1
- #define LOG\_MICROVG\_IMAGE\_close 2

- `#define LOG_MICROVG_FONT_load 0`
- `#define LOG_MICROVG_FONT_baseline 1`
- `#define LOG_MICROVG_FONT_height 2`
- `#define LOG_MICROVG_FONT_stringWidth 3`
- `#define LOG_MICROVG_FONT_stringHeight 4`
- `#define LOG_MICROVG_DRAW_path 0`
- `#define LOG_MICROVG_DRAW_pathGradient 1`
- `#define LOG_MICROVG_DRAW_string 2`
- `#define LOG_MICROVG_DRAW_stringGradient 3`
- `#define LOG_MICROVG_DRAW_stringOnCircle 4`
- `#define LOG_MICROVG_DRAW_stringOnCircleGradient 5`
- `#define LOG_MICROVG_DRAW_image 6`
- `#define CONCAT_STRINGS p ## s`
- `#define CONCAT_DEFINES CONCAT_STRINGS(p,s)`
- `#define LOG_MICROVG_START if((int32_t)&LOG_DRAWING_OPERATION) != -1) { \`  
`LLTRACE_IMPL_record_event_u32(vg_trace_group_id, event, type); }`
- `#define LOG_MICROVG_END if((int32_t)&LOG_DRAWING_OPERATION) != -1) { \`  
`LLTRACE_IMPL_record_event_end_u32(vg_trace_group_id, event, type); }`

## 2.7.2. Variables

- `int32_t vg_trace_group_id`

## 2.7.3. Functions

- `void LOG_DRAWING_OPERATION ( void )`

## Detailed Description

Definition in file `C:/Jenkins/workspace/master074c8e04/com.microej.clibrary.llimpl.microvg/target~/ccomponentWorking/bsp/vg/inc/microvg_trace.h`

## 2.8. vg\_drawing.h File Reference

```
#include <LLVG_PAINTER_impl.h>
```

```
#include "ui_drawing.h"
```

## 2.8.1. Functions

- void VG\_DRAWING\_get\_image\_size ( void \* image, float \* width, float \* height)
- DRAWING\_Status VG\_DRAWING\_drawPath ( MICROUI\_GraphicsContext \* gc, jbyte \* path, jint x, jint y, jfloat \* matrix, jint fillRule, jint blend, jint color)
- DRAWING\_Status VG\_DRAWING\_drawGradient ( MICROUI\_GraphicsContext \* gc, jbyte \* path, jint x, jint y, jfloat \* matrix, jint fillRule, jint alpha, jint blend, jint \* gradient, jfloat \* gradientMatrix)
- DRAWING\_Status VG\_DRAWING\_drawString ( MICROUI\_GraphicsContext \* gc, jchar \* text, jint faceHandle, jfloat size, jfloat x, jfloat y, jfloat \* matrix, jint alpha, jint blend, jfloat letterSpacing)
- DRAWING\_Status VG\_DRAWING\_drawStringGradient ( MICROUI\_GraphicsContext \* gc, jchar \* text, jint faceHandle, jfloat size, jfloat x, jfloat y, jfloat \* matrix, jint alpha, jint blend, jfloat letterSpacing, jint \* gradientData, jfloat \* gradientMatrix)
- DRAWING\_Status VG\_DRAWING\_drawStringOnCircle ( MICROUI\_GraphicsContext \* gc, jchar \* text, jint faceHandle, jfloat size, jint x, jint y, jfloat \* matrix, jint alpha, jint blend, jfloat letterSpacing, jfloat radius, jint direction)
- DRAWING\_Status VG\_DRAWING\_drawStringOnCircleGradient ( MICROUI\_GraphicsContext \* gc, jchar \* text, jint faceHandle, jfloat size, jint x, jint y, jfloat \* matrix, jint alpha, jint blend, jfloat letterSpacing, jfloat radius, jint direction, jint \* gradientData, jfloat \* gradientMatrix)
- DRAWING\_Status VG\_DRAWING\_drawImage ( MICROUI\_GraphicsContext \* gc, void \* image, jfloat \* matrix, jint alpha, jlong elapsed, const float color\_matrix, jint \* errno)

## Detailed Description

Definition in file C:/Jenkins/workspace/master074c8e04/com.microej.library.llimpl.microvg/target~/ccomponentWorking/bsp/vg/inc/vg\_drawing.h

## 2.9. vg\_drawing\_bvi.h File Reference

```
#include "microvg_configuration.h"
```

## Detailed Description

Definition in file C:/Jenkins/workspace/master074c8e04/com.microej.library.llimpl.microvg/target~/ccomponentWorking/bsp/vg/inc/vg\_drawing\_bvi.h

## 2.10. vg\_drawing\_stub.h File Reference

```
#include "vg_drawing.h"
```

### 2.10.1. Functions

- DRAWING\_Status VG\_DRAWING\_STUB\_drawPath ( MICROUI\_GraphicsContext \* gc, jbyte \* path, jint x, jint y, jfloat \* matrix, jint fillRule, jint blend, jint color)
- DRAWING\_Status VG\_DRAWING\_STUB\_drawGradient ( MICROUI\_GraphicsContext \* gc, jbyte \* path, jint x, jint y, jfloat \* matrix, jint fillRule, jint alpha, jint blend, jint \* gradient, jfloat \* gradientMatrix)
- DRAWING\_Status VG\_DRAWING\_STUB\_drawString ( MICROUI\_GraphicsContext \* gc, jchar \* text, jint faceHandle, jfloat size, jfloat x, jfloat y, jfloat \* matrix, jint alpha, jint blend, jfloat letterSpacing)
- DRAWING\_Status VG\_DRAWING\_STUB\_drawStringGradient ( MICROUI\_GraphicsContext \* gc, jchar \* text, jint faceHandle, jfloat size, jfloat x, jfloat y, jfloat \* matrix, jint alpha, jint blend, jfloat letterSpacing, jint \* gradientData, jfloat \* gradientMatrix)
- DRAWING\_Status VG\_DRAWING\_STUB\_drawStringOnCircle ( MICROUI\_GraphicsContext \* gc, jchar \* text, jint faceHandle, jfloat size, jint x, jint y, jfloat \* matrix, jint alpha, jint blend, jfloat letterSpacing, jfloat radius, jint direction)
- DRAWING\_Status VG\_DRAWING\_STUB\_drawStringOnCircleGradient ( MICROUI\_GraphicsContext \* gc, jchar \* text, jint faceHandle, jfloat size, jint x, jint y, jfloat \* matrix, jint alpha, jint blend, jfloat letterSpacing, jfloat radius, jint direction, jint \* gradientData, jfloat \* gradientMatrix)
- DRAWING\_Status VG\_DRAWING\_STUB\_drawImage ( MICROUI\_GraphicsContext \* gc, void \* image, jfloat \* matrix, jint alpha, jlong elapsed, const float color\_matrix, jint \* errno)

### Detailed Description

Definition in file C:/Jenkins/workspace/master074c8e04/com.microej.clibrary.llimpl.microvg/target~ccomponentWorking/bsp/vg/inc/vg\_drawing\_stub.h

## 2.11. LLVG\_BVI\_stub.c File Reference

```
#include "microvg_configuration.h"
```

```
#include <LLVG_BVI_impl.h>
```

### 2.11.1. Functions

- void LLVG\_BVI\_IMPL\_map\_context ( MICROUI\_Image \* ui, void \* vg)
- void LLVG\_BVI\_IMPL\_clear ( MICROUI\_GraphicsContext \* gc)

## Detailed Description

MicroVG library low level API: stubbed implementation of LLVG\_BVI\_impl.h.

Author: .    MicroEJ Developer Team

Version: .    3.0.1

Definition in file C:/Jenkins/workspace/master074c8e04/com.microej.clibrary.llimpl.microvg/target~/ccomponentWorking/bsp/vg/src/LLVG\_BVI\_stub.c

## 2.12. LLVG\_FONT\_freetype.c File Reference

```
#include "microvg_configuration.h"
```

## Detailed Description

MicroEJ MicroVG library low level API: implementation over FreeType.

Author: .    MicroEJ Developer Team

Version: .    3.0.1

Definition in file C:/Jenkins/workspace/master074c8e04/com.microej.clibrary.llimpl.microvg/target~/ccomponentWorking/bsp/vg/src/LLVG\_FONT\_freetype.c

## 2.13. LLVG\_FONT\_stub.c File Reference

```
#include "microvg_configuration.h"
```

```
#include <LLVG_FONT_impl.h>
```

```
#include <LLVG_PAINTER_impl.h>
```

### 2.13.1. Functions

- jint LLVG\_FONT\_IMPL\_load\_font ( jchar \* font\_name, jboolean complex\_layout)

- jfloat LLVG\_FONT\_IMPL\_string\_width ( jchar \* text, jint faceHandle, jfloat size, jfloat letterSpacing)
- jfloat LLVG\_FONT\_IMPL\_string\_height ( jchar \* text, jint faceHandle, jfloat size)
- jfloat LLVG\_FONT\_IMPL\_get\_baseline\_position ( jint faceHandle, jfloat size)
- jfloat LLVG\_FONT\_IMPL\_get\_height ( jint faceHandle, jfloat size)
- void LLVG\_FONT\_IMPL\_dispose ( jint faceHandle)
- bool LLVG\_FONT\_IMPL\_has\_complex\_layouter ( void )

## Detailed Description

MicroEJ MicroVG library low level API: implementation over FreeType.

Author: .    MicroEJ Developer Team

Version: .    3.0.1

Definition in file C:/Jenkins/workspace/master074c8e04/com.microej.clibrary.llimpl.microvg/target~/ccomponentWorking/bsp/vg/src/LLVG\_FONT\_stub.c

## 2.14. LLVG\_GRADIENT\_impl.c File Reference

```
#include "microvg_configuration.h"
```

## Detailed Description

MicroVG library low level API: implementation of gradient.

This implementation uses 32-bit "integer" values to store the colors and the colors positions.

Author: .    MicroEJ Developer Team

Version: .    3.0.1

Definition in file C:/Jenkins/workspace/master074c8e04/com.microej.clibrary.llimpl.microvg/target~/ccomponentWorking/bsp/vg/src/LLVG\_GRADIENT\_impl.c

## 2.15. LLVG\_impl.c File Reference

```
#include <LLVG_impl.h>
```

```
#include <LLUI_DISPLAY.h>
```



```
#include "microvg_configuration.h"
```

```
#include "microvg_helper.h"
```

```
#include "microvg_font_freetype.h"
```

```
#include "microvg_path.h"
```

```
#include "microvg_trace.h"
```

### 2.15.1. Variables

- int32\_t vg\_trace\_group\_id

### 2.15.2. Functions

- void LLVG\_IMPL\_initialize ( void )

## Detailed Description

Initializes the MicroVG implementation.

Author: .    MicroEJ Developer Team

Version: .    3.0.1

Definition in file C:/Jenkins/workspace/master074c8e04/com.microej.clibrary.llimpl.microvg/target~/ccomponentWorking/bsp/vg/src/LLVG\_impl.c

## 2.16. LLVG\_MATRIX\_impl.c File Reference

```
#include <math.h>
```

```
#include <string.h>
```

```
#include <LLVG_MATRIX_impl.h>
```

```
#include "microvg_helper.h"
```

## 2.16.1. Functions

- void LLVG\_MATRIX\_IMPL\_identity ( jfloat \* matrix)
- void LLVG\_MATRIX\_IMPL\_copy ( jfloat \* dest, jfloat \* src)
- void LLVG\_MATRIX\_IMPL\_multiply ( jfloat \* dest, jfloat \* a, jfloat \* b)
- void LLVG\_MATRIX\_IMPL\_setTranslate ( jfloat \* matrix, jfloat x, jfloat y)
- void LLVG\_MATRIX\_IMPL\_setScale ( jfloat \* matrix, jfloat sx, jfloat sy)
- void LLVG\_MATRIX\_IMPL\_setRotate ( jfloat \* matrix, jfloat degrees)
- void LLVG\_MATRIX\_IMPL\_setConcat ( jfloat \* dest, jfloat \* a, jfloat \* b)
- void LLVG\_MATRIX\_IMPL\_translate ( jfloat \* matrix, jfloat x, jfloat y)
- void LLVG\_MATRIX\_IMPL\_scale ( jfloat \* matrix, jfloat scaleX, jfloat scaleY)
- void LLVG\_MATRIX\_IMPL\_rotate ( jfloat \* matrix, jfloat angleDegrees)
- void LLVG\_MATRIX\_IMPL\_concatenate ( jfloat \* matrix, jfloat \* other)
- void LLVG\_MATRIX\_IMPL\_postTranslate ( jfloat \* matrix, jfloat dx, jfloat dy)
- void LLVG\_MATRIX\_IMPL\_postScale ( jfloat \* matrix, jfloat sx, jfloat sy)
- void LLVG\_MATRIX\_IMPL\_postRotate ( jfloat \* matrix, jfloat degrees)
- void LLVG\_MATRIX\_IMPL\_postConcat ( jfloat \* matrix, jfloat \* other)

## Detailed Description

MicroEJ MicroVG library low level API: basic implementation of matrix APIs.

Author: .    MicroEJ Developer Team

Version: .    3.0.1

Definition in file C:/Jenkins/workspace/master074c8e04/com.microej.clibrary.llimpl.microvg/target~/ccomponentWorking/bsp/vg/src/LLVG\_MATRIX\_impl.c

## 2.17. LLVG\_PAINTER\_impl.c File Reference

```
#include <LLVG_PAINTER_impl.h>
```

```
#include <LLUI_DISPLAY.h>
```

```
#include <LLVG_FONT_impl.h>
```

```
#include <LLVG_MATRIX_impl.h>
```

```
#include "vg_drawing.h"
```

```
#include "microvg_trace.h"
```

## 2.17.1. Macros

- `#define LOG_MICROVG_DRAWING_START LOG_MICROVG_START(LOG_MICROVG_DRAWING_ID, CONCAT_DEFINES(LOG_MICROVG_DRAW_, fn))`
- `#define LOG_MICROVG_DRAWING_END LOG_MICROVG_END(LOG_MICROVG_DRAWING_ID, CONCAT_DEFINES(LOG_MICROVG_DRAW_, fn))`

## 2.17.2. Functions

- `jint LLVG_PAINTER_IMPL_drawPath ( MICROUI_GraphicsContext * gc, jbyte * pathData, jint x, jint y, jfloat * matrix, jint fillRule, jint blend, jint color)`
- `jint LLVG_PAINTER_IMPL_drawGradient ( MICROUI_GraphicsContext * gc, jbyte * pathData, jint x, jint y, jfloat * matrix, jint fillRule, jint alpha, jint blend, jint * gradientData, jfloat * gradientMatrix)`
- `jint LLVG_PAINTER_IMPL_drawString ( MICROUI_GraphicsContext * gc, jchar * text, jint faceHandle, jfloat size, jfloat x, jfloat y, jfloat * matrix, jint alpha, jint blend, jfloat letterSpacing)`
- `jint LLVG_PAINTER_IMPL_drawStringGradient ( MICROUI_GraphicsContext * gc, jchar * text, jint faceHandle, jfloat size, jfloat x, jfloat y, jfloat * matrix, jint alpha, jint blend, jfloat letterSpacing, jint * gradientData, jfloat * gradientMatrix)`
- `jint LLVG_PAINTER_IMPL_drawStringOnCircle ( MICROUI_GraphicsContext * gc, jchar * text, jint faceHandle, jfloat size, jint x, jint y, jfloat * matrix, jint alpha, jint blend, jfloat letterSpacing, jfloat radius, jint direction)`
- `jint LLVG_PAINTER_IMPL_drawStringOnCircleGradient ( MICROUI_GraphicsContext * gc, jchar * text, jint faceHandle, jfloat size, jint x, jint y, jfloat * matrix, jint alpha, jint blend, jfloat letterSpacing, jfloat radius, jint direction, jint * gradientData, jfloat * gradientMatrix)`
- `jint LLVG_PAINTER_IMPL_drawImage ( MICROUI_GraphicsContext * gc, void * image, jint x, jint y, jfloat * matrix, jint alpha, jlong elapsed, const float color_matrix)`

## Detailed Description

This file implements all MicroVG drawing native functions.

See also: . LLVG\_PAINTER\_impl.h file comment

Author: . MicroEJ Developer Team

Version: . 3.0.1

Definition in file C:/Jenkins/workspace/master074c8e04/com.microej.clibrary.llimpl.microvg/target~/ccomponentWorking/bsp/vg/src/LLVG\_PAINTER\_impl.c

## 2.18. LLVG\_PATH\_impl.c File Reference

```
#include "microvg_configuration.h"
```

### Detailed Description

MicroVG library low level API: implementation of path.

This implementation uses a 32-bit "integer" value to store a path command and a 32-bit "float" value to store each command parameter.

The encoding can be overridden, see "[optional]: weak functions" in "microvg\_path.h"

Author: . MicroEJ Developer Team

Version: . 3.0.1

Definition in file C:/Jenkins/workspace/master074c8e04/com.microej.clibrary.llimpl.microvg/target~/ccomponentWorking/bsp/vg/src/LLVG\_PATH\_impl.c

## 2.19. LLVG\_PATH\_stub.c File Reference

```
#include "microvg_configuration.h"
```

```
#include <LLVG_PATH_impl.h>
```

```
#include <LLVG_PATH_PAINTER_impl.h>
```

### 2.19.1. Functions

- jint LLVG\_PATH\_IMPL\_initializePath ( jbyte \* jpath, jint length)
- jint LLVG\_PATH\_IMPL\_appendPathCommand1 ( jbyte \* jpath, jint length, jint cmd, jfloat x, jfloat y)

- jint LLVG\_PATH\_IMPL\_appendPathCommand2 ( jbyte \* jpath, jint length, jint cmd, jfloat x1, jfloat y1, jfloat x2, jfloat y2)
- jint LLVG\_PATH\_IMPL\_appendPathCommand3 ( jbyte \* jpath, jint length, jint cmd, jfloat x1, jfloat y1, jfloat x2, jfloat y2, jfloat x3, jfloat y3)
- void LLVG\_PATH\_IMPL\_reopenPath ( jbyte \* jpath)

## Detailed Description

MicroVG library low level API: stubbed implementation of LLVG\_PATH\_impl.h and LLVG\_PATH\_PAINTER\_impl.h.

Author: . MicroEJ Developer Team

Version: . 3.0.1

Definition in file C:/Jenkins/workspace/master074c8e04/com.microej.library.llimpl.microvg/target~\ccomponentWorking\bsp\vg\src\LLVG\_PATH\_stub.c

## 2.20. microvg\_helper.c File Reference

```
#include <LLVG_MATRIX_impl.h>
```

```
#include <freetype/internal/ftobjs.h>
```

```
#include "microvg_helper.h"
```

```
#include "microvg_configuration.h"
```

### 2.20.1. Macros

- #define MIN\_HIGH\_SURROGATE ((unsigned short)0xD800)
- #define MAX\_HIGH\_SURROGATE ((unsigned short)0xDBFF)
- #define MIN\_LOW\_SURROGATE ((unsigned short)0xDC00)
- #define MAX\_LOW\_SURROGATE ((unsigned short)0xDFFF)
- #define MIN\_SUPPLEMENTARY\_CODE\_POINT 0x010000
- #define GET\_NEXT\_CHARACTER ((o) >= (l) ? (unsigned short)0 : (t)[o])
- #define IS\_SIMPLE\_LAYOUT true

## 2.20.2. Variables

- static jfloat g\_identity\_matrix
- static FT\_Face face
- static unsigned short \* current\_text
- static unsigned int current\_length
- static int current\_offset
- static FT\_UInt previous\_glyph\_index

## 2.20.3. Functions

- void MICROVG\_HELPER\_initialize ( void )
- int MICROVG\_HELPER\_get\_utf ( unsigned short \* text, int length, int \* offset)  
*Gets the UTF character from a text buffer at the given offset and updates the offset to point to the next character.*
- void MICROVG\_HELPER\_layout\_configure ( int faceHandle, unsigned short \* text, int length)
- bool MICROVG\_HELPER\_layout\_load\_glyph ( int \* glyph\_idx, int \* x\_advance, int \* y\_advance, int \* x\_offset, int \* y\_offset)
- jfloat \* MICROVG\_HELPER\_check\_matrix ( jfloat \* matrix)
- uint32\_t MICROVG\_HELPER\_apply\_alpha ( uint32\_t color, uint32\_t alpha)

## Detailed Description

MicroEJ MicroVG library low level API: helper to implement library natives methods.

Author: .    MicroEJ Developer Team

Version: .    3.0.1

Definition in file C:/Jenkins/workspace/master074c8e04/com.microej.clibrary.llimpl.microvg/target~/ccomponentWorking/bsp/vg/src/microvg\_helper.c

## 2.21. vg\_drawing.c File Reference

```
#include "vg_drawing.h"
```

```
#include "vg_drawing_stub.h"
```

```
#include "bsp_util.h"
```

## 2.21.1. Macros

- `#define VG_DRAWING_DEFAULT_drawPath VG_DRAWING_drawPath`
- `#define VG_DRAWING_DEFAULT_drawGradient VG_DRAWING_drawGradient`
- `#define VG_DRAWING_DEFAULT_drawString VG_DRAWING_drawString`
- `#define VG_DRAWING_DEFAULT_drawStringGradient VG_DRAWING_drawStringGradient`
- `#define VG_DRAWING_DEFAULT_drawStringOnCircle VG_DRAWING_drawStringOnCircle`
- `#define VG_DRAWING_DEFAULT_drawStringOnCircleGradient VG_DRAWING_drawStringOnCircleGradient`
- `#define VG_DRAWING_DEFAULT_drawImage VG_DRAWING_drawImage`

## 2.21.2. Functions

- `BSP_DECLARE_WEAK_FCNT DRAWING_Status VG_DRAWING_DEFAULT_drawPath ( MICROUI_GraphicsContext * gc, jbyte * path, jint x, jint y, jfloat * matrix, jint fillRule, jint blend, jint color)`
- `BSP_DECLARE_WEAK_FCNT DRAWING_Status VG_DRAWING_DEFAULT_drawGradient ( MICROUI_GraphicsContext * gc, jbyte * path, jint x, jint y, jfloat * matrix, jint fillRule, jint alpha, jint blend, jint * gradient, jfloat * gradientMatrix)`
- `BSP_DECLARE_WEAK_FCNT DRAWING_Status VG_DRAWING_DEFAULT_drawString ( MICROUI_GraphicsContext * gc, jchar * text, jint faceHandle, jfloat size, jfloat x, jfloat y, jfloat * matrix, jint alpha, jint blend, jfloat letterSpacing)`
- `BSP_DECLARE_WEAK_FCNT DRAWING_Status VG_DRAWING_DEFAULT_drawStringGradient ( MICROUI_GraphicsContext * gc, jchar * text, jint faceHandle, jfloat size, jfloat x, jfloat y, jfloat * matrix, jint alpha, jint blend, jfloat letterSpacing, jint * gradientData, jfloat * gradientMatrix)`
- `BSP_DECLARE_WEAK_FCNT DRAWING_Status VG_DRAWING_DEFAULT_drawStringOnCircle ( MICROUI_GraphicsContext * gc, jchar * text, jint faceHandle, jfloat size, jint x, jint y, jfloat * matrix, jint alpha, jint blend, jfloat letterSpacing, jfloat radius, jint direction)`
- `BSP_DECLARE_WEAK_FCNT DRAWING_Status VG_DRAWING_DEFAULT_drawStringOnCircleGradient ( MICROUI_GraphicsContext * gc, jchar * text, jint faceHandle, jfloat size, jint x, jint y, jfloat * matrix, jint alpha, jint blend, jfloat letterSpacing, jfloat radius, jint direction, jint * gradientData, jfloat * gradientMatrix)`
- `BSP_DECLARE_WEAK_FCNT DRAWING_Status VG_DRAWING_DEFAULT_drawImage ( MICROUI_GraphicsContext * gc, void * sni_context, jfloat * matrix, jint alpha, jlong elapsed, const float color_matrix, jint * errno)`

## Detailed Description

Definition in file C:/Jenkins/workspace/master074c8e04/com.microej.library.llimpl.microvg/target~/ccomponentWorking/bsp/vg/src/vg\_drawing.c

## 2.22. vg\_drawing\_stub.c File Reference

```
#include "vg_drawing_stub.h"
```

### 2.22.1. Functions

- static DRAWING\_Status not\_implemented ( MICROUI\_GraphicsContext \* gc)
- DRAWING\_Status VG\_DRAWING\_STUB\_drawPath ( MICROUI\_GraphicsContext \* gc, jbyte \* path, jint x, jint y, jfloat \* matrix, jint fillRule, jint blend, jint color)
- DRAWING\_Status VG\_DRAWING\_STUB\_drawGradient ( MICROUI\_GraphicsContext \* gc, jbyte \* path, jint x, jint y, jfloat \* matrix, jint fillRule, jint alpha, jint blend, jint \* gradient, jfloat \* gradientMatrix)
- DRAWING\_Status VG\_DRAWING\_STUB\_drawString ( MICROUI\_GraphicsContext \* gc, jchar \* text, jint faceHandle, jfloat size, jfloat x, jfloat y, jfloat \* matrix, jint alpha, jint blend, jfloat letterSpacing)
- DRAWING\_Status VG\_DRAWING\_STUB\_drawStringGradient ( MICROUI\_GraphicsContext \* gc, jchar \* text, jint faceHandle, jfloat size, jfloat x, jfloat y, jfloat \* matrix, jint alpha, jint blend, jfloat letterSpacing, jint \* gradientData, jfloat \* gradientMatrix)
- DRAWING\_Status VG\_DRAWING\_STUB\_drawStringOnCircle ( MICROUI\_GraphicsContext \* gc, jchar \* text, jint faceHandle, jfloat size, jint x, jint y, jfloat \* matrix, jint alpha, jint blend, jfloat letterSpacing, jfloat radius, jint direction)
- DRAWING\_Status VG\_DRAWING\_STUB\_drawStringOnCircleGradient ( MICROUI\_GraphicsContext \* gc, jchar \* text, jint faceHandle, jfloat size, jint x, jint y, jfloat \* matrix, jint alpha, jint blend, jfloat letterSpacing, jfloat radius, jint direction, jint \* gradientData, jfloat \* gradientMatrix)
- DRAWING\_Status VG\_DRAWING\_STUB\_drawImage ( MICROUI\_GraphicsContext \* gc, void \* image, jfloat \* matrix, jint alpha, jlong elapsed, const float color\_matrix, jint \* errno)

## Detailed Description

Definition in file C:/Jenkins/workspace/master074c8e04/com.microej.library.llimpl.microvg/target~/ccomponentWorking/bsp/vg/src/vg\_drawing\_stub.c